

OCCURRENCE OF TREMATODE ARTYFECHINOSTOMOSIS IN PIG OF LAKHIMPUR DISTRICT OF ASSAM

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ABSTRACT

Trematode Artyfechinostomosis is a parasitic disease which affects men and pig and having zoonotic importance was evaluated in the pig population in the Lakhimpur district of Assam. Seventy -six numbers of carcasses were examined from various unorganised slaughter houses of Lakhimpur district and foothills of Assam and Arunachal Pradesh. 25 percent of prevalence was found to be positive as nineteen numbers were established to be affirmative for Artyfechinostomum sufarthyfex. Additional studies were done to define the prevalence of echinostome cercarial fauna in the snail intermediate hosts. The echinostome cercariae were recovered from Indoplanorbis exustus, the snail intermediate host for this parasite. Occurrence of the snail intermediate hosts within this area were determined by accumulating different species of snails from numerous pockets within the study area. Among all the species of snails collected, the prevalence of Indoplanorbis exustus was found to be the highest (25.32%).

KEYWORDS: Pig, Snail, Artyfechinostomum Sufrathyfex, Zoonosis

Received: Nov 28, 2016; **Accepted:** Dec 20, 2016; **Published:** Dec 23, 2016; **Paper Id.:** IJASRFEB20177

INTRODUCTION

Parasitic disease Artyfechinostomosis is caused by a trematode *Artyfechinostomum sufarthyfex* and other related species of the genus. Pig and men are affected by this parasite which populates the intestines. This parasite and other related species completes their life cycle involving *Indoplanorbis* spp., *Gyraulus* spp., *Lymnaea* spp., *Pilas* spp., *Viviparus* spp. and *Filopaludina* spp. of snails as first intermediate host (WHO, 1995; Pariyanonda and Tesana, 1990) and freshwater snails, bivalves, fish, and tadpoles as the second intermediate host (Weerachai *et al.*, 2013). Transmission of the disease occurs by ingestion of raw aquatic second intermediate hosts (Carney, 1991). In human the disease is manifested by diarrhoea, vomiting, anorexia and weight loss

(Raghunathan *et al* 1962) and in pigs *Artyfechinostomum oraoni* aggravates fatal diarrhoea (Bandyopadhyay *et al.*, 1989). The parasite has been recounted from Assam time to time from the year 1915 as reported by Lane, 1915. Two epidemics of artyfechinostomosis with piglet deaths were also recounted in Bengal, India (Bhattacharya *et al.*, 1972). This parasite has been recorded from most of the Asian countries affecting man and pig populations (Jueco *et al*, 1984; Cabrera *et al.* 1986; Eduardo, 1989; Monzon *et al*, 1989). Apart from *Artyfechinostomum sufrartyfex* other echinostomids that affects the avian species can also infect humans (Kittichai *et al.*, 2013). In a slaughter house study in Mumbai, India the prevalence of *Artyfechinostomum sufrartyfex* in pigs was recorded 7.58 percent (Gaurat, *et al*, 2005. and Tandon *et al* 2007). *Artyfechinostomum sufrartyfex* along with other parasites were recorded from pig carcasses in Aizawl district of Mizoram during June, 2004 to May, 2005 (Borthakur *et al.*, 2007). Pig population of Assam is 16, 36, 02 according to the 19th Livestock census which is 2nd in North East India where whole pig population is 39,54,330. The huge pig population and the arrangement of nurturing of pigs in this area and the occurrence of the parasite among pig populations may provide an easy source of contamination for the human population. The crucial determinant of the transmission of the disease is prevalence of snail intermediate host in the study area. Various species of freshwater snails act both as the first and the second intermediate hosts of echinostomes (Pariyanonda *et al*, 1995, Sri-Aroon, 2011). A widespread study on the cercarial fauna in the freshwater snail population can give an indication of the occurrence of the disease. Current study was directed to evaluate the occurrence of artyfechinostomosis in pigs. The occurrence of intermediate hosts of these parasites and the degree of contamination in the snails and the zoonotic nature of the disease makes this study more noteworthy.

MATERIALS AND METHODS

Study Area

The study on the prevalence of these parasites was primarily based on collection of parasite specimens from unorganised slaughter houses in the areas adjoining to the foothills of Arunachal Pradesh in the Lakhimpur district of Assam throughout a period of one year. Various species of freshwater snails were also collected from different pockets of Lakhimpur district within that period.

Identification of Snails and Harvesting of Cercariae

The collected snails were identified on the basis of their morphological characters and subsequently were cultured in the laboratory to release the echinostome cercariae.¹²

Identification of the Adult Parasite

The adult parasites collected from the slaughter houses were later fixed and then cleared in xylene. Further the cleared specimens were mounted in DPX for morphological characterization. The rates of prevalence of the parasite in pigs and of the echinostome cercariae in the snail were also recorded to see if there was any correlation.

RESULTS

Identification of the Adult Parasite

The fresh flukes in the intestine were pink in colour when it was collected (Figure 1). It measured around 8.5 mm in length and 2.5 mm in breadth. The cuticle is spiny. The oral sucker is provided with rows of collar spines and with each corner having 5 spines. The ventral sucker is much larger than the oral. Testes are tandem and deeply lobed. Ovary is pretesticular. On the basis of these morphological features it was identified as *Artyfechinostomum sufrartyfex* (Figure 2).

Prevalence of the Parasite

Throughout the study period, 76 numbers of carcasses were examined. Out of which 19 numbers were to be found positive for *Artyfechinostomum sufrartyfex*. Hence the prevalence rate was 25 percent.

Collection of Snail for Harvesting Cercariae

Freshwater snails were collected and on the basis of their morphological features they were identified as *Indoplanorbis exustus*, *Lymnaea auricularia* and *Lymnaea luteola*. The pattern of prevalence of the snails in the district within the study period is presented in Table 1 and Figure 4. The prevalence of *Indoplanorbis exustus* was recorded highest (27.43%) during the study period. They were kept for releasing cercariae (echinostome cercariae). Out of all the snail species only *Indoplanorbis exustus* released the echinostomes (Figure 3) and furcocercus cercariae. The snails so collected were also randomly subjected to observe the encysted metacercariae, if any within their tissues. But no metacercariae were recovered.

DISCUSSIONS

Although various species of snails were reported to act as second intermediate host of echinostomids, no metacercariae were recovered in any of the representing specimen of different species of snails collected during the study period (Pariyanonda *et al*, 1995, Sri-Aroon, 2011). Further exploration in other aquatic animals and snails for the recovery of metacercariae may be recommended in the future.

Although there were scanty recent reports of human echinostomosis in Assam and the North- Eastern parts of India, artyfechinostomosis was reported for the first time from a girl in Assam (Lane, 1915). Hence the significance of the disease among human population of this area cannot be neglected as echinostomosis in general is a zoonotic disease and the recovery of echinostome cercariae from the snails carries its zoonotic significance.

CONCLUSIONS

The prevalence of *Artyfechinostomum sufrartyfex* in the pig population, availability of the snail intermediate host and the release of echinostome cercariae by the snail may indicate the presence of the disease in human population. Although reports of human cases were scanty in this region, an extensive case study may be the need of the hour. Ante mortem diagnosis of artyfechinostomosis in pigs, proper diagnosis and treatment of both human & animal cases are the prerequisites for prevention of this disease.

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APPENDICES



Figure 1: Fresh Specimen of *Artyfechinostomum Sufrartyfex*



Figure 2: Mounted Specimen of Artyfechinostomum Sufrartyfex



Figure 3: Echinostome Cercariae



Figure 4: Indoplanorbis Exustus

Table 1: Occurrence of Snail Populations in Lakhimpur District of Assam

	Species of snail	Duration of collection of snails												Total Numbers
		January	February	March	April	May	June	July	August	September	October	November	December	
1	<i>Bellamya bengalensis</i>	6	8	14	20	24	31	33	36	31	26	21	19	269
2	<i>Bellamya dissimilis</i>	4	7	11	14	17	24	26	28	26	29	9	6	201
3	<i>Indoplanorbis exustus</i>	17	25	38	46	48	59	72	80	71	51	36	23	566
4	<i>Lamellidens corrianus</i>	5	7	11	13	16	19	24	27	23	17	14	9	185
5	<i>Lymnaea auricularia</i>	14	23	31	39	43	56	84	92	83	44	31	19	559
6	<i>Lymnaea luteola</i>	9	13	17	23	27	30	32	35	38	19	15	11	269
7	<i>Melanoides tuberculata</i>	6	9	11	14	16	22	24	27	24	14	11	8	186
Total														2235

